THE

AGRICULTURAL MUSEUM

OMNIS FERET OMNIA TELLUS. VIRG.

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LUCUBRATIONS ON SOILS.—No. 4.

The mountainous region comprehending the mountains and the intermediate vallies, is very extensive, and might undergo a variety of divisions and subdivisions, respect being had either to the surface, or to the different strata of rocks, ochres and metals which here abound, and form the bed on which this whole region rests. The surface might be divided into glades, slopes and vallies, and be styled sand-stone glades, schistous slopes, pyritous or calcareous vallies, &c. as those rocks, as ferruginous loam or till, or as iron or other metal prevailed. This region might also be called *Parent earth*; because it is the oldest and highest earth of which all new soils are formed. The soil in this region is closer, more impermeable and more retentive, than in the regions we have already described; because the laws of affinity and gravitation, and the other great laws of nature acting upon its component articles, have had time in the immense lapse of ages, to give them harder, purer, and more solid forms. Its sands have agglutinated and form rocks, its clays have been changed to ochres, to alumn, and transformed in various ways to other hard substances. What once were shells are here solid rock; its calx and sulphur are converted into metals, and its ligneous and vegetable substances, into pit coal and slate. If it was not for the retentive and impermeable properties of these solid substances, and the adhesive texture of its soil, the obliquity and elevation of the surface, would not permit it to retain a sufficiency of moisture for the purposes of vegetation, and

the whole would become a barren waste. The adhesiveness of the soil counteracts the uneveness of the surface, and is justly proportioned by the hand of its bountiful creator, to the purposes of vegetation. This region partakes somewhat of the qualities and appearance of the hilly country, and has lost all superficial traces of the alluvial. The rocks, which in the hilly region only shew their projective points, and can only be partially observed and remotely traced, time having worn and carried away all the looser and lighter substances, which compose a large portion of the surface of the alluvial region, and the covering of the rocks in the hilly region, has here laid bare, and masses of rock stud the whole face of this country. The earth is also in many places almost covered with its fragments, which communicate to the soil various qualities, and many times great fertility. The fertility of the soil in this region depends also greatly upon the form of the surface, as is easily conceived in so elevated and broken a country. Vallies sufficiently level for all the purposes of cultivation, and of considerable extent, are interspersed among the ridges of mountains. These monopolize nearly all the riches of this country, the mountains being too steep to retain them in any quantity. There are portions of this region which, notwithstanding their great elevation, enjoy a source of moisture and fertility peculiar to their situation,—I mean the glades which by reason of their elevation, being cooler than the country below, gather the mists rarefied by the heat in the vallies and on the slopes of the mountains, and are in consequence, watered during the summer months, with continual light rains and fogs, while the country below them is parched with drought and heat. Such is the tract of country beyond Fort Cumberland in Maryland, called the Green Glades, which abounds in excellent pasturage. All glades do not however possess this advantage.

The observation made with respect to the size of the trees in the hilly region, is more applicable to the mountainous region; because the soil is still closer, and the rocks lie still shallower: In some of the vallies however, where the mould and vegetable substances from the mountain steeps, have been obstructed and gathered many feet in depth, trees of enormous size are found. The trees which prevail in this region, are those which delight in a high, dry, firm soil. These vary in their kind and species according to the fertility of the soil in this region. The growth of the mountain steeps is very different from that of the dry vallies. On the steep sides of the mountains and parched summits, stunted oaks and meagre starveling pine is the prevailing growth. In the vallies you find all kinds of oily nut trees, of hard wood, viz. hickory, shell bark hickory, white wallnut, hazzle nuts, also ash, beach, wild cherry, maple, poplar and locust, which last prevail most in calcareous vallies.

My opportunities will not allow me to assign to each kind of tree mentioned, the part of this region in which it most delights. This much is ascertained, that they prevail more in the mountainous region than in the other regions already described.

With these few generalizing observations upon the classification of soils, and with this imperfect description of the regions we have enumerated and attempted to bound, I shall leave that part of the subject, and go on, in my subsequent numbers, to complete the promise which I made in the preliminary remarks to this essay. If I do not so regularly hereafter furnish my numbers, I hope the busy season of the spring will palliate my omission. SYLVANUS.

NOTE.

I first hazarded stating the idea of trees succeeding each other in consequence of the change of the soil, in my second number and afterwards as the subject of trees ocurred, upon my own observation and the observation

of some old men of my acquaintance. A few days ago, I for the first time, met with the memoirs of the Philadelphia Agricultural Society, which from various sources and high Agricultural authority, establishes the fact in a manner, not to be doubted. The honorable Richard Peters labors the subject handsomely, and has collected a great variety of letters and extracts to prove the circumstance. My idea of the regular, gradual and uniform course of nature in the change of soils, being the great and leading cause (though certainly not the only cause) of the succession of trees, seems not to occur to Mr. Peters or any of his highly intelligent correspondents. He labors to prove by the analogy of trees, the necessity of a succession of crops. This no doubt is sound argument, and among the best modes of establishing the necessity of a change; but let the change be made with sound discretion according to the nature of the plant and of the soil.

Here follow some Extracts on the subject, very much in point, to prove the Succession of Trees.

Extract of a letter from JOHN ADLUM, Esq. of Havre de Grace, Maryland, dated Sept. 16, 1807.

"As to your query respecting a rotation or succession of forest trees, I am as well satisfied of it in my own mind, as if I had lived to see the whole change for centuries back, and although it may be difficult to give the information that may be satisfactory, I have no doubt that I could convince any person as to the fact, were he to travel over the country with me. I first took the idea in the summer of 1788, when I was surveying lands south of the great bend of Susquehanna, between that river and the Delaware, in what is called the beech and sugar maple country. In the course of my surveying, I traversed some places consisting of a few acres each, growing red and white oak trees of an enormous size, none being less than 16 feet in circumference, five feet above the ground, and generally from 40 to 50 feet to the branches; some few red oaks were 22 feet in

circumference, and the white oaks 20 feet round. I was struck with astonishment to meet a few trees of the oak kind, considering that I had not seen any for some weeks After discovering the first few, I kept a look out for more such places, and as well as I can remember, I found two more of the same kind, containing trees of the same enormous size. The places mentioned were near the heads of the Susquehanna and Delaware; and where the streams were small, I invariably found small bodies of very large hemlock (pinus Abies Americana) trees (the prevailing timber) near those places; the remainder of the trees consisted of beech, sugar maple, with a few white walnut, white ash, birch, &c. but no oaks."

In those parts of the country where the prevailing timber consisted of sugar maple, beech, and birch, I observed large trees growing as it were on stilts, their roots being three feet above the ground, which trees undoubtedly grew on old logs that had either fallen with age, or had been thrown down by hurricanes, and had rotted away from the roots of the trees.

"The clumps of oak and hemlock are generally in the midst of, or surrounded by, large bodies of beech and sugar maple, and mixed with some ash and a few wild cherry and hemlock trees. In some parts of the country, the prevailing timber is still hemlock on the sides of the hills and along streams.

"From the circumstance of the great size of all the oak trees growing in the spots noted above, it appears to me that most of the high country, including the head waters of the Delaware, Allegany, and Genessee rivers, was originally an oak country. The hemlock appears to have succeeded the oak, for there is still a considerable quantity of that timber over the face of the country, but from the number of logs of it lying on the ground, and its visible decline, I think the beech, sugar maple, &c. succeeded the hemlock, as they are the prevailing timber at present. The timber that appears to me will take

place of all others in the country before mentioned is the white ash and wild cherry, for I observed that all places where the woods have been blown down by hurricanes for a number of years back, the young growth consists principally of those two kinds of trees, and the largest saplins of them which I saw, were six to nine inches diameter. I suppose that the appearance of the latter trees commenced between twenty and thirty years back, counting from 1794 or 1795. There are several of those wind falls in the remote parts of Pennsylvania and New York, near the line dividing the two States; they are generally 1-8th rarely 3 4ths of a mile wide, and several miles in length, and in every one that I saw, and that did not appear to have happened more than from 20 to 30 years back, the ash and wild cherry were the prevailing timber."

Extract from a publication of Rembrandt Peale.

"Many of the cavities between these knolls are dry, others are in a state of ponds, but an infinite number containing morasses, which must originally have been ponds supplied by springs which still flow at their bottoms, and filled in the course of ages with a succession of shell fish, and the decay of vegetables; so that at present they are *covered with timber*, and have been so with in the memory of man. An old man, upwards of sixty, informed us, that all the difference he could remark between these morasses now, and what they were *fifty years ago*, was, that then they were generally COVERED WITH FIRS, and NOW WITH BEECH. This was verified by the branches and logs of fir which we found in digging.

"Judge Peters corroborates the fact in a variety of ways. Among other things he says, "My son also brings to my recollection, that when we surveyed the tract, called in old times the *pine Tract*, in Northampton county, a great number of ASH TREES were intermixed with the present growth of oak and hickory."

Dr. Caldwell observes, in a letter to Judge Peters. "The following fact I believe to be well known to many of the

most reputable inhabitants of New Jersey. Certain tracts of that state are covered entirely with forests of pine. If these be cut down, and the land not put immediately under cultivation, they are succeeded in a few years by a plentiful growth of young oaks."

I feel gratified in being able to adduce such strong auxilliary testimony.

SYLVANUS.

ON MANURES.

As manures cannot always be procured in sufficient quantities to dress all the land the farmer would wish, I will put him in a way, from my own experience, by which, with a few shillings, and a little labour, he may dress an acre of land, or as many as he pleases.

In sands and gravels, buckwheat ploughed in while green, is a good dressing. The land should be ploughed in the fall, and laid up in ridges, to bring the land into a fine tilth; harrowed and ploughed in the spring; and in the beginning of May should be sown with a bushel and a half of buckwheat, and harrowed in. In July, when in full bloom, it should be well rolled and ploughed in, in broad lands. When this is done, there will some appear above ground, between the furrows, that the plough did not cover. This must be stuck down with an iron instrument, like a paddle or paving shovel; and let it lie in that state for a month.

In this time it will smoke so as to be seen a great way, like a dunghill, and as it is a green dressing, it will quickly rot in the ground. The next thing is to harrow it in; then plough and sow wheat in broad lands. If you have a good crop of buck-wheat, it will be a good deessing for three years.

This great improver of land is such a friend to the farmer, that if its value was more generally known, this method would be more practised.

Clover ploughed in, is a good green dressing. You may mow the first crop; and if you have a good second

crop, do not be afraid of ploughing it in, as it will fully repay you in your crop of wheat. It should be rolled and ploughed in the same way as the buck wheat. After it has lain some time to rot, you may harrow in your wheat, for it should not be ploughed again as directed for the buckwheat.

Thorough ploughing, in a great measure, supplies the want of manure, by keeping the earth in a loose state, ready for the reception of atmospherical influence.

It is much more profitable to increase the fruitfulness of land by tillage than by dung; because only a certain quantity of dung can oftentimes be had, the produce of ten acres, being scarcely sufficient to dung one; whereas the particles of the earth may be divided and subdivided. The benefit that can be procured from dung is therefore limited; whereas, no bounds can be set to the advantages which arise from tillage.

Mr. Evely, quoting Sir Hugh Platt, says, that if you take a certain quantity of even the most barren earth you can find, reduce it to a fine powder, and expose it for a year to the vicissitudes and changes of the seasons and the influences of the heavens, it will acquire such a generous and masculine pregnancy, within that period, as to be able to receive any foreign plants from the farthest Indies, and to cause all vegetables to prosper in the most exalted degree, and to bear their fruits as kindly with us as they do in their natural climates.

We are to suppose these foreign plants to have their due degrees of heat and moisture given them. To what shall we ascribe this great fertility? To the great division of the particles of the earth, and the multiplication of their surfaces.

By thus pulverizing the earth, adds he, it is found that soils may be so altered from their former nature, as to render the harsh and most uncivil clay, obsequious to the husbandman, and to bring forth roots and plants, which otherwise require the lightest and hollowest mould. [*Pennsyl. Farmer.*

Richmond Agricultural Society.

At a meeting of the Richmond Society for promoting Agriculture, held on the second instant:

The corresponding Committee, who were required by a resolution of the last meeting, to make a report specifying the particular objects to which the attention of the Society should be directed, and the best means of obtaining information thereon, did, in conformity to the said resolution, submit to the Society, a number of queries; which being read and considered, were, after some amendments and additions, approved, and ordered to be published.

They are now published, under a hope, that the persons qualified to give information on any of the subjects to which they relate, will consider themselves as individually called on to communicate to the Society, for the public benefit, the results of their observation and experience.

The object of the society is to collect from every quarter and to diffuse all the information which has a tendency to promote the Agriculture of Virginia. It is well known that there are in various parts of this state, individuals distinguished for their industry, skill and success, in the cultivation of the earth. Knowledge however can be imparted by oral communication but to a few; and the beneficial influence of individual practice, however judicious and profitable, must be confined within very narrow limits—To remedy this evil, the society proposes to collect all the practical Agricultural knowledge of the country, and to convey it to the public in the way which may be deemed most conducive to the general welfare. In this undertaking they call for, and confidently expect, the aid of all whose studies and labors enable them to add to, or improve the public stock of Agricultural information.

GEORGE HAY, Sec'ry.

April 7, 1811.

QUERE

1st. The best mode of restoring worn out land, filling up gullies, and bringing it in order for the plough.

2nd. The best rotation of crops in which Indian corn, wheat and clover are included.

3d. Do. In which tobacco, wheat and clover are included.

4th. Do. for a sandy soil including Indian corn.

5th. Do, for a clayey soil including wheat.

6th. The best rotation of crops, for new lands, with a notice of the particlar soils.

7th. The best mode of preventing lands under the plough from washing.

8th. The comparative advantages and disadvantages of the two systems, that of inclosing for the purpose of excluding stock, or keeping a large stock—which will produce the greatest annual profit, and which will tend most to the improvement of the soil.

9th. The best method practicable on a large scale, of bringing exhausted lands into a condition to bring clover.

10th. The best mode of clearing new land, and bringing it in order for cultivation.

11th. How are broom straw old fields best brought into cultivation; how is the broom-straw most effectually eradicated, and reduced into manure.

12th. The best rotation of crops for river low grounds, in which wheat, corn, and clover are included.

13th. Is there any ameliorating crop that can be cultivated between a corn and a wheat crop with advantage.

14th. The comparative advantages and disadvantages of wheat and tobacco as the principal crop, taking into account, in each case, the distance from market.

15th. Whether Indian corn can be cultivated year after year on the same land with advantage, and to what species of soils is this mode of cultivation best suited?

16th. The best method of preparing land for Indian corn and cultivating it.

17th. The most effectual mode of protecting Indian corn, after clover lay, from the worm.

18th. How is wheat most effectually protected againt the Hessian fly.

19th. The advantages and disadvantages of deep ploughing, and what soil is it best suited to?

20th. Do. of Coultering.

21st. The comparative advantages of fall, winter, and spring, ploughing for Spring crops.

22nd. A rotation of crops in which annual leguminous plants follow Indian corn and precede wheat.

23d. Which is the best preparation for wheat, a fallow or clover lay.

24th. The best method of securing wheat against the weevil.

25th. Is there any annual leguminous crop that can be cultivated to advantage upon a large scale in a rotation of crops.

26th. Can Barley be cultivated to advantage on a large scale in a rotation of crops—To what soils and situation is it best suited.

27th. Which is to be preferred, winter or Spring Barley, and in what parts of the country.

28th. On what lands and in what courses of crops can oats be cultivated to the greatest advantage.

29th. What varieties of wheat are preferred in any particular district; to what soils are they respectively best suited.

30th. Do. as to Indian Corn.

31st. A notice of the diseases of wheat that are most injurious, the preventatives and remedies.

32. What species of grain is found to exhaust Lands in the greatest degree, and a comparative estimate of the expence of cultivation and product.

33 In what soils and situations can Rye be cultivated to the greatest advantage; in what mode, and in what rotation of crops, and what is the most profitable application of it.

34th Will Rye yield a profit if sown in the Autumn, and fed off in the Spring; and to what species of stock is it best suited?

35th. The soil and culture that are best suited to hemp, the expence and product.

36th. A detailed account of the whole management of hemp, from the preparation of the ground to the dressing it, and preparing it for market—an estimate of the expence and product.

37th. Do. as to Flax.

38th. Ditto as to Cotton.

39th. The best mode of draining swamp lands, and converting them into meadow.

40th. How are watered meadows best formed, and what soils and situations in the middle and lower country can be improved in this way with advantage?

41st. Is there any method by which lucerne, clover, or land under tillage, can be watered with advantage, in those districts of country?

42d. Are embankments practicable on an extended scale on the larger rivers, above or below tide water, and the mode of forming them?

43d. What green food is best suited to cattle in the winter, and early in the spring, which will best answer the expence of cultivation?

44th. Have lucerne, saintfoin, vetches or cichory, been cultivated by any person to a considerable extent, and with what success?

45. Ditto as to cabbages, parsnips, carrots and pumpkins, in a course of field cultivation for the use of cattle.

46th. What soils and situations are best suited for turnips; which is the best mode of cultivating them for the use of stock on a large scale; how are they best preserved, and which is the best application of them.

47th. Which is the best method of securing a large crop of clover Hay.

48th. To what kind of stock is it best suited.

49th. The forming and management of timothy meadows; will they succeed in the lower country, and under what circumstances.

50th. Are there any other meadow grasses that are to be preferred to timothy, and in what soils.

51st. Will burnet answer when cultivated on an extended scale; what soils is it best suited to; how is it to be cultivated, and what is the best application of it.

52nd. The comparative advantages and disadvantages of the use of horses and mules in husbandry, and the soils and situations to which they are respectively best suited.

53d. Do. of horses and oxen.

54th. The best preventatives and cure of the diseases among horned cattle called the bloody murrain—the history of its origin and progress in this country, and whether it is more contagious in one district than another.

55th. The causes and cure of the disease among Horses called the yellow water—Is it contagious, and under what circumstances.

56th. The diseases of sheep how are they best guarded against and what are the remedies.

57th. The best breeds of cattle, sheep or hogs in any particular district, are there any situations to which they are better suited than others—and is there any particular system of management to which the different breeds are respectively best suited?

58th. The best means of increasing the stock of sheep. To what soils and situations are they best suited?

59th. The most advantageous mode of raising and fattening hogs within inclosures.

60th. Will the practice of shutting up cattle, and supplying them with green food in the growing seasons, instead of turning them out to pasture, answer in this country? Has the experiment ever been tried, and to what situations is it best suited?

62d. The most beneficial application of Plaster, and to what soils it is best suited.

61st. The quantity of plaster sufficient to manure an acre—How often should it be repeated; with a specification of the soils to which it has been applied.

63d. Is there any species of fossil manure that can be found in large quantities in the Middle Country, and that can be used to advantage.

64th. Is marle (properly so called) to be found in the upper country, has it ever been used as a manure, and with what success.

65th. Has marle ever been used in the lower country. Have the strata of shells that abound there ever been found beneficial as manure?

66th. Will Green Crops raised and turned in by the plough improve the land, and will the improvement be equal to the expence—What plants are best suited to this purpose, and the mode of cultivation?

67th Which is the best method of turning straw, and corn stalks into manure?

68th. How is the greatest quantity of manure to be obtained from Stock in the winter, due attention being paid to keeping them in order?

69th. Is the practice of folding cattle and sheep in the Summer, on the whole, advantageous or otherwise, and what are the particular advantages, or disadvantages of it, as wellwith reference to the stock as the land; to what soils is it best suited?

70th. The best application of manure in a rotation of of Crops in which wheat and indian corn are included.

71st. Do. where tobacco and wheat are cultivated—due attention being paid to the nature of the soil in each instance.

72nd. Is manure applied with most advantage in a fresh state, or after it has gone through a fermentation?

73d. The best mode of raising large quantities of manure from fattening Hogs—Can straw be used for litter in large quantities without injury to the hogs?

74th. Are farm pens for stock in the winter on the whole beneficial, and what is the best plan for constructing them?

75th. Does plaster when combined with other manures remarkably increase their effects?

The best management of Orchards

76th. Do. of a Dairy Farm—is the Dairy a profitable object to be attended to on a large scale, and in what situations?

77th. Whether Arable Lands can be converted into grazing farms with an increase of profit and in what situations?

78th. The kinds of ploughs that are used in different districts, are there any lately introduced that have peculiar advantages, and what are they?

79th. Do. as to Threshing Machines, Waggons, Carts and Implements of Agriculture in general.

80th. The best mode of extirpating the Wild Garlic, and other troublesome weeds.

81st. What improvement can be made on our present inclosures—Can live hedges be raised, from what plants, and will they form a sufficient fence—To what soils and situations are they best suited?

82nd. A source of any improvement in husbandry or the management of rural affairs in any district.

83d. Whether in any particular part of the country the system of husbandry is improving, and in what the improvement consists?

84th Do. whether it is declining, and in what respect.

The quantity of seed, wheat and other small grain proper for an acre, with a reference to the soil and time for sowing. Do. of Clover Seed.

[*Enquirer.*]

Numerous as are the above QUERIES, the greater part of them are nevertheless highly important. It is hoped they will attract the attention of the practical Farmers and Planters of our Country.—The Editor will be happy to afford a place to their Lucubrations in the *Agricultural Museum.*

POTATOES

Preferable to a Summer Fallow for WHEAT.

Extract of a letter from the Revd. Samuel Austin, of Worcester, to the Editor of the Medical and Agricultural Register, dated Worcester, (Mass.) February 24, 1806.

"There is one species of husbandry, not in general practice, in which I have made some experiments with

considerable success; that is, to substitute a crop of potatoes in the room of a summer fallow* as a preparation for Wheat. Wheat is doubtless the best and most profitable grain that can be raised. No species of vegetable adds so much ornament to a country, and none affords a more essential or grateful part of that aliment by which human nature is preserved. The potatoe also is a valuable root. For the horse it is an excellent and healthful substitute, for the green grass which he crops in his summer pasture, and seems nearly indispensable to be united with his dry winter fodder, to preserve him from those diseases to which he is so exposed in the cold season. Every intelligent farmer knows its value for feeding his swine, his sheep and his cattle; and no crop is more sure or more easily raised; none is so plentiful. Warm, loomy land, and such is the greatest part of this Commonwealth, well manured, will yield three hundred bushels to the acre. They may be taken off, if planted in season, by the middle of September, and the ground will be in the best situation to put in immediately a crop of wheat. This is altogether better than summer fallowing, and the crop of potatoes is a clear saving. I have in this way, had 25 bushels of most excellent winter wheat on the acre. I have now a piece of land under wheat according to this mode of management, which is of so promising an appearance as to be noticed with special attention by my neighbors.—The land ought to have an early fall ploughing, if under a binding sward, and the potatoes should be hoed twice. If this mode of agriculture should go into general practice, the probability is, that it would add materially to the prosperity of our country.

* Summer tilling; or letting land rest from one crop without being seeded.

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